

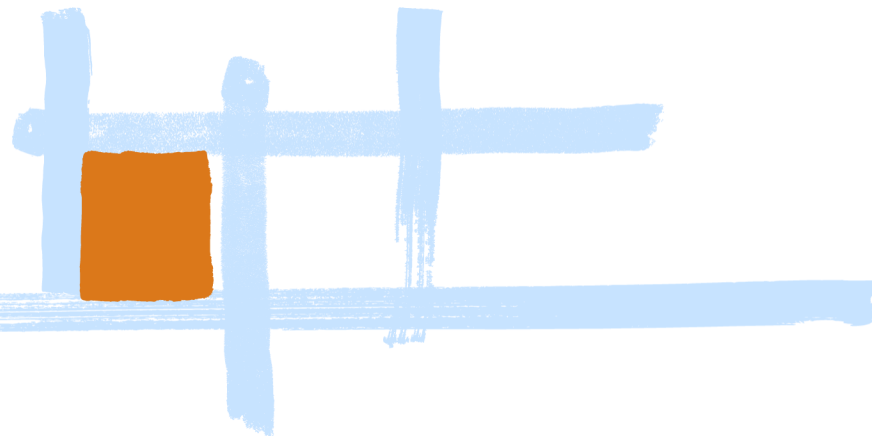


RESEARCH CORPORATION
for SCIENCE ADVANCEMENT

Community at Our Core

2024 Annual Report

Letter from the President



As I look back on 2024, my last full year as President of RCSA, I would like to share a few thoughts on what has made us successful, and perhaps even a bit special. Yes, we provide financial support for scientists to pursue novel research, but during my last eight years at the foundation I have seen time and again that three other aspects of our work stand out: community building, a holistic approach to the people we support, and welcoming into our programs a broad array of physical scientists.

Each of our programs is designed to bring together scientists who might otherwise not interact because of field, institutional type, or location. Cottrell Scholars, Scialog Fellows, and RCSA Fellows come from chemistry, physics, astronomy, and overlapping disciplines; they are based at (or for RCSA Fellows, currently seeking positions at) research universities, comprehensive universities, and liberal arts colleges; and they are geographically spread out at institutions across the United States and Canada. Our primary aim in devoting time and effort to community building is to create networks of mutually supportive science faculty, which can lead to highly productive collaborations and—simply, but importantly—to sharing and discussing common issues and concerns to reduce potential feelings of isolation and stress that cannot always be effectively addressed within a home department.

We strive to stay connected to participants in our programs in their many roles as faculty, and as their careers evolve. Cottrell Scholars work together on science education and career development projects. For example, RCSA has funded and continues to be involved in the “Teach Better” books co-authored by Cottrell Scholars, and in the Academic Leadership Training program that started as a Cottrell Scholars Collaborative project led by Rigoberto Hernandez, Peter Dorhout, and Karen Bjorkman. Quite a few Scialog Fellows have become Scialog Facilitators as they transition from assistant professor to senior faculty positions, and several collaborative research teams have formed between early career Fellows and later-career Facilitators.

Finally, we have seen over and over the importance of bringing together faculty from a wide spectrum of backgrounds to share perspectives on how research is conducted, how students are best educated, and how careers can be enhanced. How AI will change student learning and evaluation, or how communicating science with public audiences can be enhanced, are just two examples of challenges that would benefit from such conversations. Especially important in creating these communities has been active outreach to encourage scientists with a wide variety of backgrounds, perspectives, and life experiences to apply to our programs. The Cottrell Scholar and

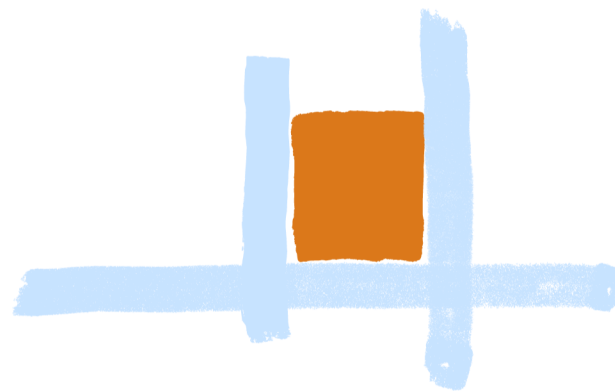
Scialog programs have strong records over many years, and we anticipate that the more recent Holland Award and RCSA Fellows will amplify these efforts to increase access and opportunity in the physical sciences.

Our conviction is that science research and education, careers in science, and trust and appreciation of science are all strengthened by building and nurturing communities of scientists. I look forward to seeing how RCSA continues to evolve to address this essential goal most effectively. My thanks to all the members of the foundation, and to our partner foundations and federal funding agencies, for joining together in these efforts.



Daniel Linzer
President & CEO
Research Corporation for
Science Advancement

2024 Programs & Awards

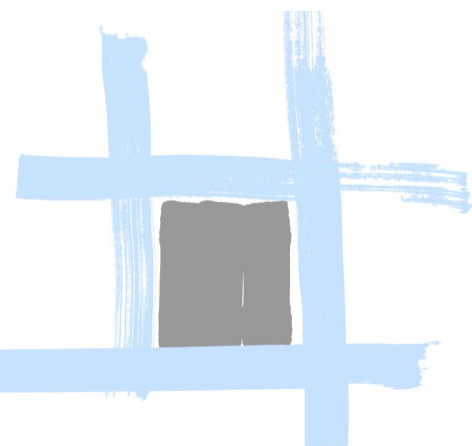
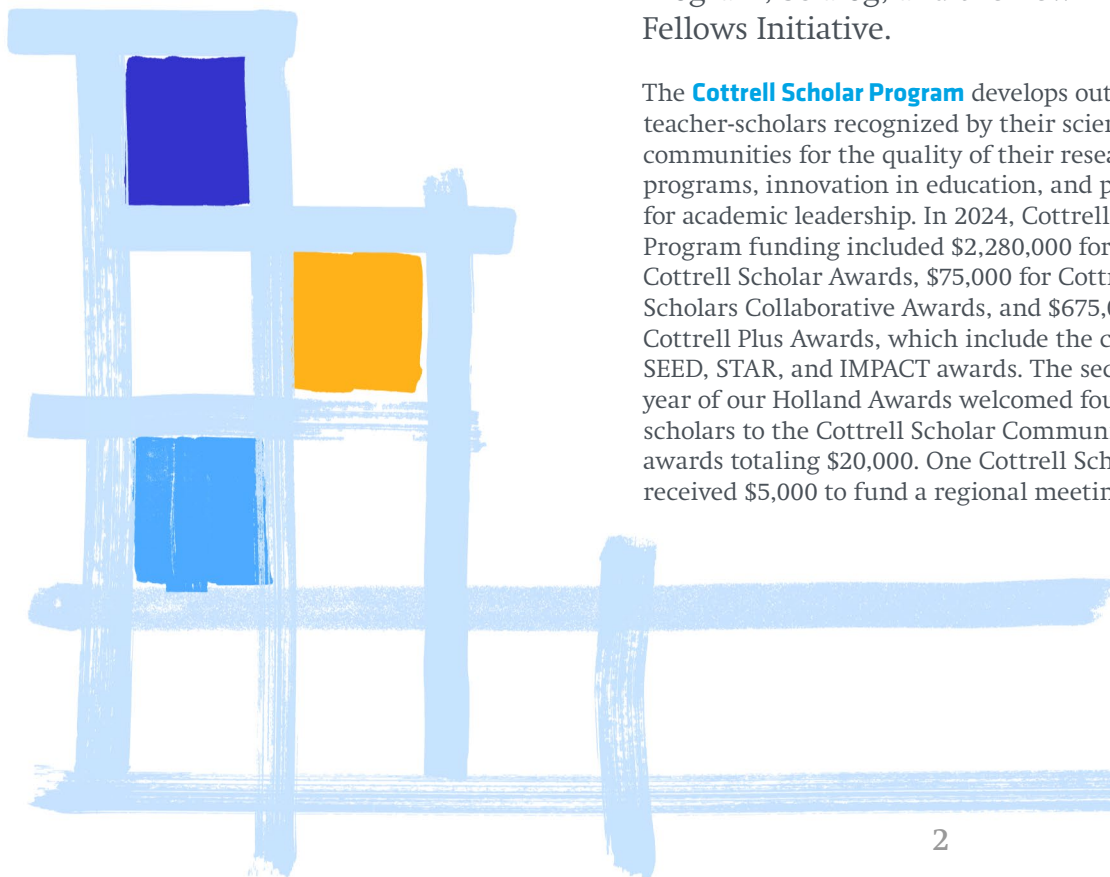


In 2024, Research Corporation for Science Advancement supported early career scientists at colleges and universities in the United States and Canada through three programs: the Cottrell Scholar Program, Scialog, and the new RCSA Fellows Initiative.

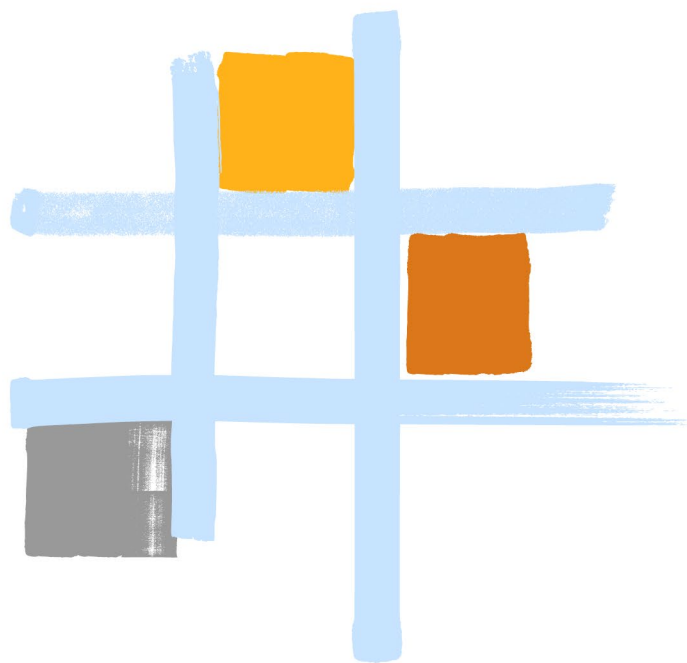
The **Cottrell Scholar Program** develops outstanding teacher-scholars recognized by their scientific communities for the quality of their research programs, innovation in education, and potential for academic leadership. In 2024, Cottrell Scholar Program funding included \$2,280,000 for 19 initial Cottrell Scholar Awards, \$75,000 for Cottrell Scholars Collaborative Awards, and \$675,000 for Cottrell Plus Awards, which include the competitive SEED, STAR, and IMPACT awards. The second year of our Holland Awards welcomed four senior scholars to the Cottrell Scholar Community with awards totaling \$20,000. One Cottrell Scholar received \$5,000 to fund a regional meeting.

Scialog, celebrating its 15th year in 2024, promotes dialogue and community-building to catalyze transformational science through collaborative, interdisciplinary research. In 2024, RCSA awarded \$1,587,000 to early career scientists for research through Scialog Collaborative Innovation Awards. Partner philanthropies – which in 2024 included the Arnold and Mabel Beckman Foundation, the Brinson Foundation, the Frederick Gardner Cottrell Foundation, the Heising-Simons Foundation, the Alfred P. Sloan Foundation, The Kavli Foundation, the Leinweber Foundation, the Walder Foundation, and independent donor Kevin Wells – contributed a further \$3,187,000 toward Scialog awards.

The **RCSA Fellows Initiative** named eight postdoctoral scholars as RCSA Fellows in the first year of this effort to increase faculty excellence in the physical sciences through job search preparation and community building.



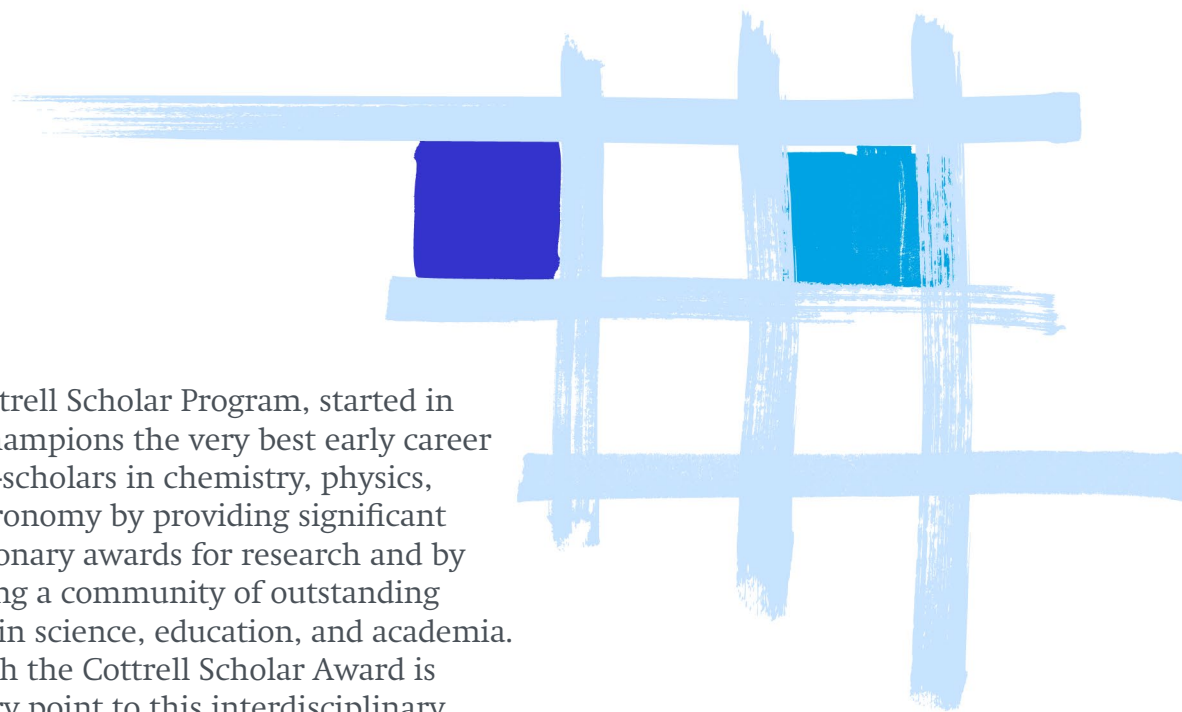
Cottrell Scholar Program



The Cottrell Scholar Program, started in 1994, champions the very best early career teacher-scholars in chemistry, physics, and astronomy by providing significant discretionary awards for research and by nurturing a community of outstanding leaders in science, education, and academia. Although the Cottrell Scholar Award is the entry point to this interdisciplinary community, the program also supports scholars throughout their academic careers with competitive Cottrell Plus awards.

Maintaining an active, multigenerational community of academic scientists is a unique aspect of the Cottrell Scholar program. Cottrell Scholars engage in an annual networking event, providing them an opportunity to share insights and expertise through the Cottrell Scholars Collaborative.

In 2024, the Cottrell Scholar community welcomed 19 new Cottrell Scholars, four Robert Holland Jr. Award winners, and two recipients of the German-American Fulbright Commission's Fulbright-Cottrell Award.

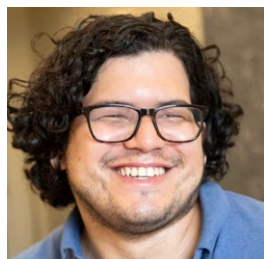
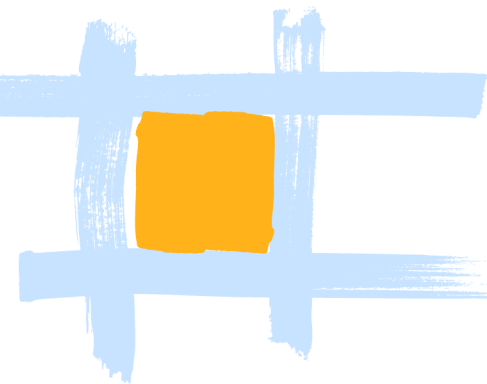


“This community has been so valuable, and I think that the positive and supportive atmosphere at the Cottrell Conferences has been instrumental for me both for making space for teaching in my professional life, and for setting high expectations for working with colleagues.”

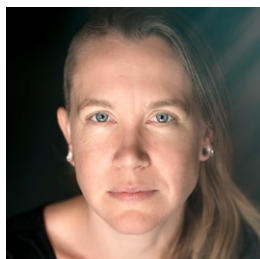
Cottrell Scholar 2014 Dinah Loerke

Cottrell Scholar Awards

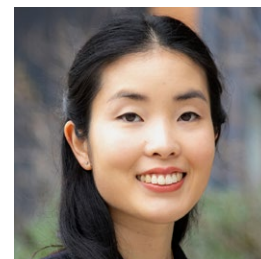
\$120,000 was awarded to each scholar for a total of \$2,280,000.



Carlos Argüelles Delgado
Physics,
Harvard University
Searching for New Physics with Galactic Neutrinos



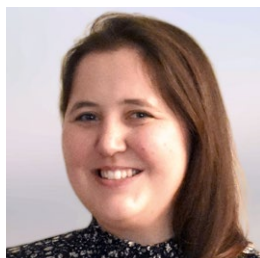
Katherine de Kleer
Astronomy,
California Institute of Technology
Planetesimal Interiors: Searching for Evidence of Core Material



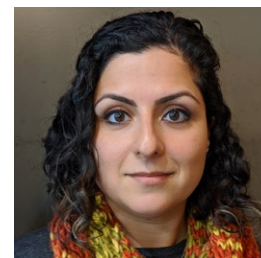
Leslie Hamachi
Chemistry,
California Polytechnic State University, San Luis Obispo
Colloidal Stabilization of Covalent Organic Frameworks with Acid-Base Chemistry and STEM Educator Training



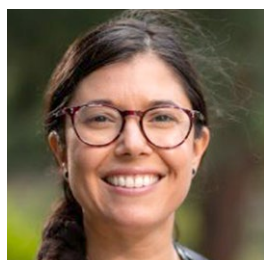
Bernadette Broderick
Chemistry,
University of Missouri
A New Tool to Probe Condensed-Phase Chemistry: Rotational Spectroscopy of Buffer-Gas Cooled Molecules Desorbed from an Ice Surface



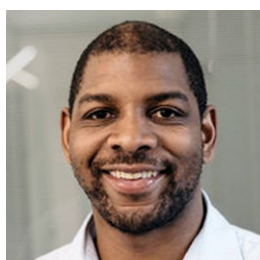
Meagan Elinski
Chemistry,
Hope College
Chemical-Mechanical Control over Nanoparticle-Hydrogel Sliding Interfaces



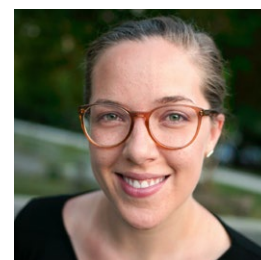
Farnaz Heidar-Zadeh
Chemistry,
Queen's University
Combining Quantum Chemistry Concepts and Machine Learning for Drug Discovery



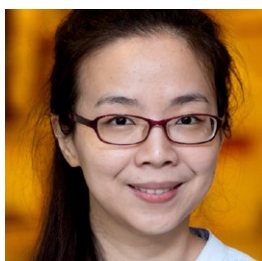
Lía Corrales
Astronomy,
University of Michigan
Unveiling Cosmic Treasures: Exploring the Secrets of Astromineralogy with X-Ray Imaging Spectroscopy



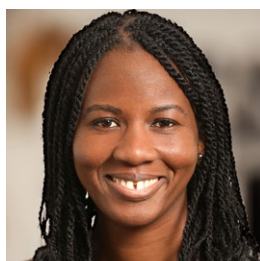
Jacob Gayles
Physics,
University of South Florida
Strain Manipulation of Charge and Spin Dynamics in 2D Magnets



Tova Holmes
Physics,
University of Tennessee, Knoxville
Next Generation Beams: Exploring the Potential of Muon Acceleration



Fang Liu
 Chemistry,
 Emory University
*Machine Learning Aided
 Quantum Chemistry Discovery
 in the Solution Phase*



Denise Okafor
 Chemistry,
 Pennsylvania State University
*Allostery and Architecture:
 Building and Validating
 Functional Models of Multidomain
 Receptors*



Timothy Su
 Chemistry,
 University of California,
 Riverside
*Skeletal Editing of Silicon
 Nanostructures & Student-
 Created Social Media Videos to
 Close the Achievement Gap*



Anne Medling
 Astronomy,
 University of Toledo
*Doing Our Homework: Direct
 Tests of Black Hole Accretion
 Rate Prescriptions*



Rebecca Rapf
 Chemistry,
 Trinity University
*Interface-Induced Changes
 to Electronic Structure and
 Reactivity of Environmentally
 Relevant Polycyclic Aromatic
 Species*



Jessica Swanson
 Chemistry,
 University of Utah
*Probing the Role of Membranes
 in Bacterial Methane Oxidation
 with Multiscale Simulations*



Maren Mossman
 Physics,
 University of San Diego
*Cloud-Based Investigations of
 Quantum Hydrodynamics in
 Ultracold Atomic Gases*



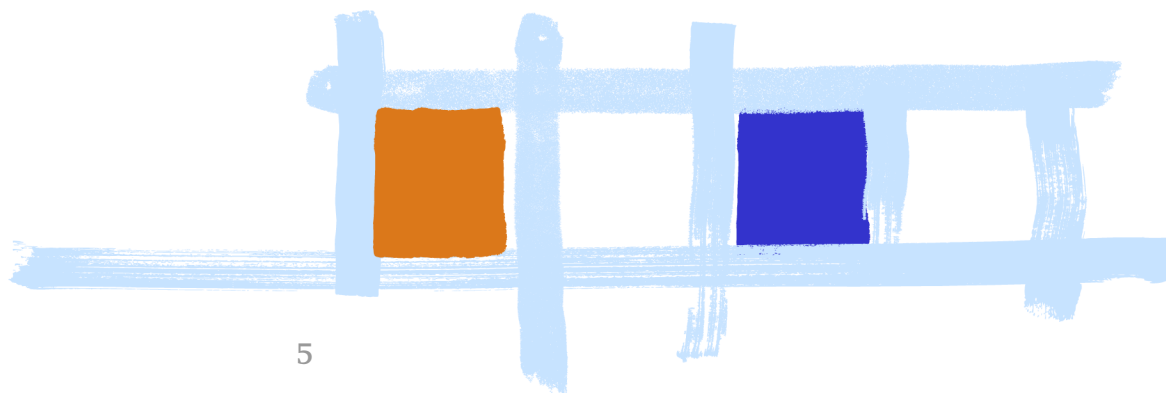
Paul Robustelli
 Chemistry,
 Dartmouth College
*Characterizing and Modulating
 Interactions of Disordered
 Proteins that Drive Biomolecular
 Condensate Formation and
 Cytotoxic Aggregation*



Michael Welsh
 Chemistry,
 Hamilton College
*Characterization of Enzymes
 that Build and Degrade Spore
 Cortex Peptidoglycan*



Johanna Nagy
 Physics,
 Case Western Reserve
 University
*Measuring Cosmic Birefringence
 in the Presence of Galactic
 Foregrounds and Improving
 Career Preparation through
 Advanced Physics Labs*



Cottrell Scholars Collaborative Awards



At the annual Cottrell Scholar Conference, participants are encouraged to form teams and develop collaborative projects with potential national impact in science education. Through the Cottrell Scholars Collaborative program, RCSA gave awards of \$25,000 each to three projects in 2024.

Cottrell Lectureships: Seeding Speaker-Sharing Between R1s and Local PUIs

Science departments at predominantly undergraduate institutions often have difficulty recruiting speakers for academic colloquia due to budgetary constraints, while research universities may have larger budgets that allow them to recruit speakers from around the country and the world. This project aims to create speaker-sharing partnerships between R1s and smaller nearby colleges where speakers would visit several institutions in one trip, reducing the carbon impact of travel, enriching academic life at smaller colleges, and seeding relationships between faculty at close-by institutions that could lead the way to future partnerships.

Lead Cottrell Scholar:

Matthew Caplan

Physics, Illinois State University

In collaboration with additional Cottrell Scholars:

Graham Giovanetti

Physics, Williams College

Leslie Hamachi

Chemistry, California Polytechnic State University, San Luis Obispo

Timothy Su

Chemistry, University of California, Riverside

Lisa Szczepura

Chemistry, Illinois State University

Sergei Urazhdin

Physics, Emory University

Rory Waterman

Chemistry, University of Vermont

AI Research Coach – Cottrell Scholars Collaborative (ARC-CSC): Partnering with AI to Scale Up Access to Research Experience for Science Majors

Undergraduates interested in science need significant independent research experience before applying to graduate or professional schools, but early career faculty are often short on time to reliably train and mentor them. This project aims to teach and equip an existing Large Language Model to coach students through early opportunities for open-ended problem solving and basic research experiences. After training with the coach, promising students would then transition to higher-touch supervision by a PI to begin contributing to a lab or research group.

Lead Cottrell Scholar:

Vera Gluscevic

Astronomy, University of Southern California

In collaboration with additional Cottrell Scholars:

Carlos Argüelles Delgado

Physics, Harvard University

Darcy Barron

Physics, University of New Mexico

Rachel Bezanson

Astronomy, University of Pittsburgh

Lia Corrales

Astronomy, University of Michigan

Daniela Fera

Chemistry, Swarthmore College

Jonathan Foley

Chemistry, University of North Carolina at Charlotte

Farnaz Heidar-Zadeh

Chemistry, Queen's University

Tova Holmes

Physics, University of Tennessee, Knoxville

Johanna Nagy

Physics, Case Western Reserve University

William Pfalzgraff

Chemistry, Chatham University

Chad Risko

Chemistry, University of Kentucky

Eduardo Rozo

Physics, University of Arizona

Ryan Trainor

Astronomy, Franklin & Marshall College

Cottrell Scholar Regional Meetings

CottreLLM: Leveraging Artificial Intelligence to Enhance Student Learning in Computational Science Courses

Advances in general Large Language Models create new opportunities to integrate programming and computation into chemistry, physics, and astronomy classes. While these efforts can lower barriers to entry and broaden participation in STEM education, the technology is changing so rapidly it remains unknown how educators should best leverage LLMs as coding assistants in their courses to advance student learning and success. This project will create “how-to” materials to guide instructors and develop an initial set of guidelines that can be assessed and refined in coordination with education researchers.

Lead Cottrell Scholar:

Jonathan Foley

Chemistry, University of North Carolina at Charlotte

In collaboration with additional Cottrell Scholars:

Carlos Argüelles Delgado

Physics, Harvard University

Timothy Atherton

Physics, Tufts University

Lia Corrales

Astronomy, University of Michigan

Meagan Elinsk

Chemistry, Hope College

Vera Gluscevic

Astronomy, University of Southern California

Farnaz Heidar-Zadeh

Chemistry, Queen's University

Rigoberto Hernandez

Chemistry, Johns Hopkins University

Tova Holmes

Physics, University of Tennessee, Knoxville

Geoffrey Hutchison

Chemistry, University of Pittsburgh

William Pfalzgraff

Chemistry, Chatham University

Davit Potoyan

Chemistry, Iowa State University

Grace Stokes

Chemistry, Santa Clara University

David Strubbe

Physics, University of California, Merced

Ryan Trainor

Astronomy, Franklin & Marshall College

Christina Vizcarra

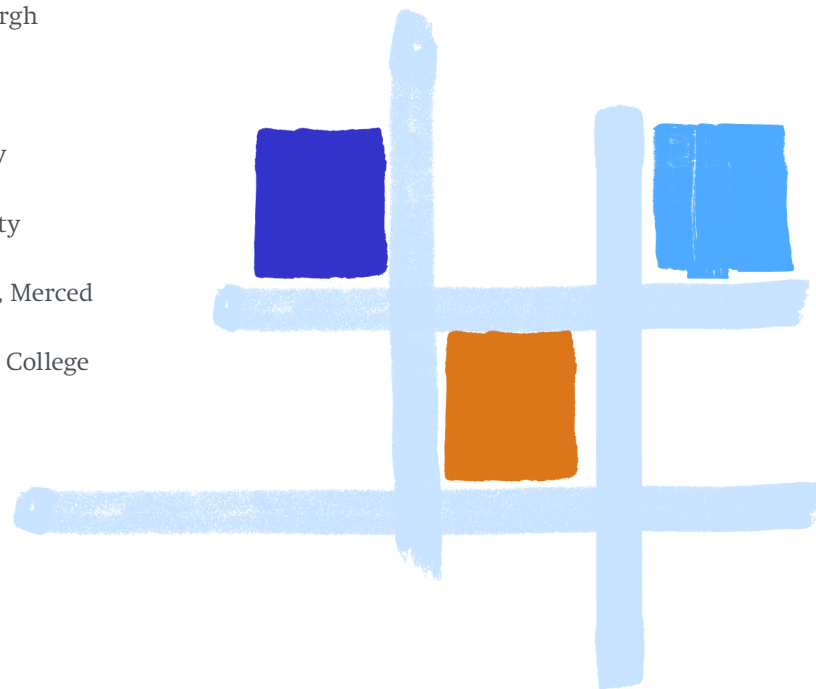
Chemistry, Barnard College

RCSA makes funds available to Cottrell Scholars who wish to host one-day regional meetings at their institutions to discuss research, teaching, and career development. In 2024, RCSA awarded \$5,000 for one regional meeting.

Rae Robertson-Anderson

Physics, University of San Diego

Soft Matter at USD



Cottrell Plus Awards

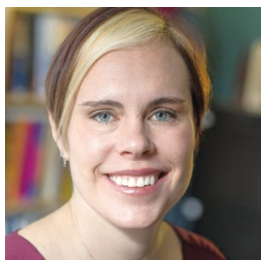
As their scientific careers advance, Cottrell Scholars are eligible to receive post-tenure Cottrell Plus Awards to further support their research and educational activities. In 2024, SEED, STAR, and IMPACT awards were given.

SEED (*Singular Exceptional Endeavors of Discovery*) Awards are competitive grants of \$60,000 each to launch new projects. In 2024, RCSA expanded SEED Awards to include two categories: *New Research Directions*, and *Exceptional Opportunities*. New Research Directions awards, for innovative research projects with potential to lead to a transformative line of inquiry, were open to Cottrell Scholars and Holland Award recipients from research universities and primarily undergraduate institutions. Exceptional Opportunities awards, to advance existing research projects at primarily undergraduate institutions to higher levels of innovation and impact, were open to Cottrell Scholars and Holland awardees at non-doctoral departments.

STAR (*Excellence in Science Teaching and Research*) Awards of \$5,000 recognize the outstanding research and educational accomplishments of Cottrell Scholars and encourage the improvement of science education at American and Canadian universities and colleges.

IMPACT Awards of \$5,000 recognize the work of Cottrell Scholars who have had a national impact in science through their leadership and service activities.

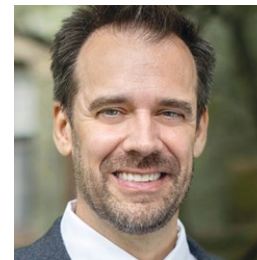
SEED Awards for New Research Directions



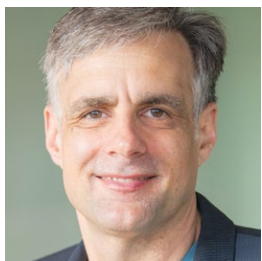
Erin Carlson, **SEED**
Cottrell Scholar 2012
University of Minnesota
Twin Cities
*Eradication of Bacterial
Resistance Mechanisms*



Darren Johnson, **SEED**
Cottrell Scholar 2006
University of Oregon
*Supramolecular Capture and
Release of PFAS: SEEDing
the Center for Aqueous
Supramolecular Chemistry*



Eric Schelter, **SEED**
Cottrell Scholar 2013
University of Pennsylvania
*New Directions for Sustainable
Separations of Battery Materials*



Bert Chandler, **SEED**
Cottrell Scholar 2001
Pennsylvania State University
*Beating Thermodynamics:
Understanding How Spillover
Protons Weaken CO2 Binding in
Carbon Capture Materials*



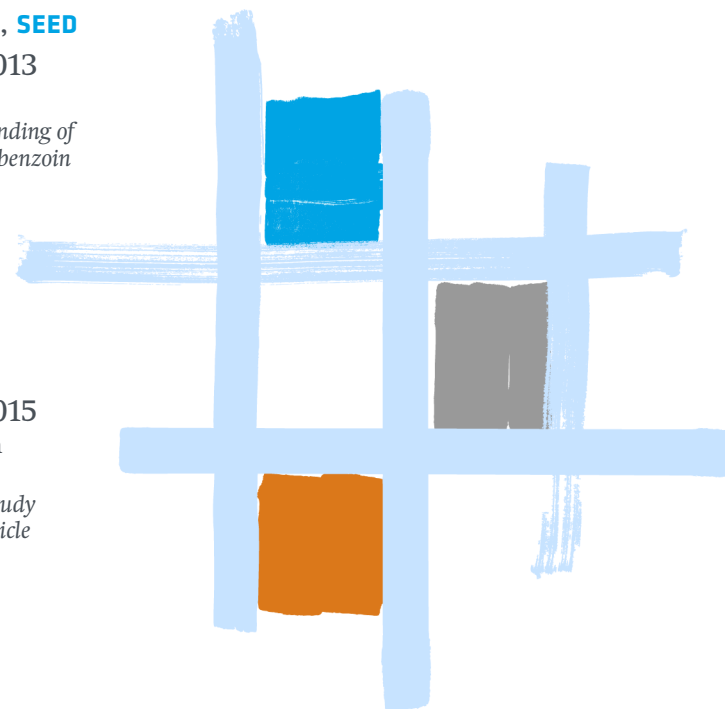
Ognjen Š. Miljanić, **SEED**
Cottrell Scholar 2013
University of Houston
*Putting Water to Work: Binding of
Methane Hydrates in Cyclobenzoin
Supramolecular Hosts*



Robert Gilliard, **SEED**
Holland Awardee 2023
Massachusetts Institute of
Technology
*Transition Metal-Free Reactivity of
Redox-Activated Carbon Dioxide*



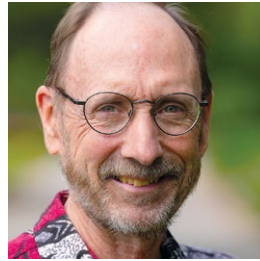
Jill Millstone, **SEED**
Cottrell Scholar 2015
University of Pittsburgh
*Using Photocatalytic
Reduction to Isolate and Study
Intermediates in Nanoparticle
Formation Reactions*



SEED Awards for Exceptional Opportunities



Paulo Almeida, **SEED**
Cottrell Scholar 2005
University of North Carolina
Wilmington
*Quantitative Approach to
Peptide-Lipid Interactions in
Membranes*



George Shields, **SEED**
Cottrell Scholar 1994
Furman University
*Peptide Formation in
Nanoclusters of Water in the
Prebiotic Atmosphere*



Mark Moldwin, **STAR**
Cottrell Scholar 1997
University of Michigan



Aaron Leconte, **SEED**
Cottrell Scholar 2016
Scripps College
*Towards XNA PCR: Evaluating
the Potential of Fusion Domains
to Improve XNA Polymerases*



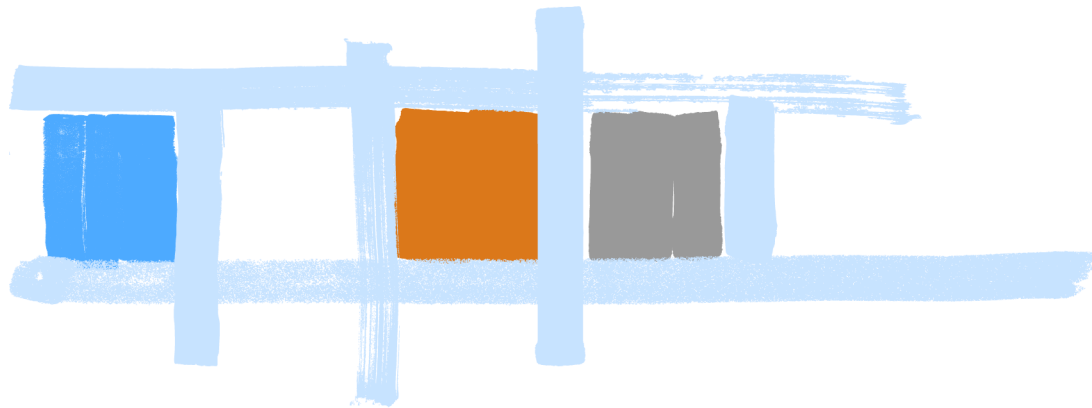
Adam Urbach, **SEED**
Cottrell Scholar 2005
Trinity University
*Order from Disorder:
Programmable Induction
of Polypeptide Folding with
Synthetic Receptors*



Maura McLaughlin, **IMPACT**
Cottrell Scholar 2009
West Virginia University



Rory Waterman, **IMPACT**
Cottrell Scholar 2009
University of Vermont



Robert Holland Jr. Awards

Four senior scientists with impressive records of scholarship, leadership, and impact received **Robert Holland Jr. Awards** for research excellence, leadership, creativity, and mentoring in the physical sciences. The awards welcome recipients as full members of the Cottrell Scholar community and come with a \$5,000 cash prize.



Marcel Agüeros
Astronomy,
Columbia University



Nadya Mason
Physics,
University of Chicago



Jorge López
Physics,
University of Texas, El Paso



Leyte Winfield
Chemistry,
Spelman College

Scialog = science + dialog

The **Scialog** program was created in 2010 by RCSA, which oversees its administration. Scialog – short for “**science + dialog**” – funds early career scientists to pursue transformative research with their fellow grantees on crucial issues of scientific inquiry. Scialog initiatives are a multi-year thematic investment, in which around 50 early career Scialog Fellows, facilitated by a group of leading scientists, convene annually to discuss cutting-edge multidisciplinary themes and propose high-risk collaborative projects.

“There’s a lot of bad in the world right now, but the efforts of RCSA and all the Scialog folks and the friends they keep, that’s a real good slice. It was my honor to be a part of it.”

Scialog MBC Fellow Tim Mosca

Scialog Collaborative Innovation Awards

\$4,774,000 was awarded to early career scientists for research through these four multi-year programs.

RCSA convened four Scialog conferences in 2024. RCSA, along with its funding partners, provided a total of \$4,774,000 in seed funding for collaborative team projects. In 2024, individual awards were \$50,000 each in direct costs for Molecular Basis of Cognition in its third and final year, and \$60,000 for the other initiatives, which were in their first year.

Automating Chemical Laboratories

Goal: Catalyze collaborative projects that use artificial intelligence, machine learning, laboratory robotics, high-throughput synthesis, and automated analytical workflows to drive discovery, open access, and transform the way chemical laboratories operate.

Funding: Provided by RCSA, the Arnold and Mabel Beckman Foundation, and the Frederick Gardner Cottrell Foundation.

Sustainable Minerals, Metals, and Materials

Goal: Catalyze collaborative, cross-disciplinary projects to investigate how to design, manufacture, and recycle substances so that their use and production at scale is more compatible with ethical stewardship of our environment and decarbonizing the energy system.

Funding: Provided by RCSA, The Alfred P. Sloan Foundation, and The Kavli Foundation.

Molecular Basis of Cognition

Goal: Catalyze teams of researchers working across disciplines, including neurobiology, neuroscience, and related cognitive sciences, to devise new ways to probe the chemistry, biology, physics, and computational science that underlie memory and other cognitive processes.

Funding: Provided by RCSA, the Frederick Gardner Cottrell Foundation, the Canadian Institute for Advanced Research (CIFAR), The Kavli Foundation, the Walder Foundation, and the Azrieli Foundation.

Early Science with the LSST

Goal: Advance the foundational science needed to realize the full potential of the Vera C. Rubin Observatory's upcoming Legacy Survey of Space and Time.

Funding: Provided by RCSA, the Heising-Simons Foundation, The Brinson Foundation, the Leinweber Foundation, and independent philanthropist Kevin Wells.

Automating Chemical Laboratories

Year 1

Calibration-Free Quantitation of Reaction Yields in High-Throughput Reaction Screening through Absolute Carbon Quantification by LC-FID

James Grinias
Chemistry & Biochemistry,
Rowan University

Connor Coley
Chemical Engineering
& Electrical Engineering
and Computer Science,
Massachusetts Institute of
Technology

Jessica Sampson
Chemistry and Biochemistry,
University of Delaware

Getting on the Grid: Parallel Nano-Crystallography for Large-Scale Data Generation

Michael McGuirk
Chemistry,
Colorado School of Mines

Andrea Pickel
Mechanical Engineering,
University of Rochester

Automated Workflows to Assess Physical Constraints in Neural Networks for Molecular Property Prediction

Grant Rotskoff
Chemistry,
Stanford University

Aditi Krishnapriyan
Chemical Engineering /
Computer Science,
University of California,
Berkeley

Andrew Zahrt
Chemistry,
University of Pennsylvania

Reducing the Cost of Device Development with Closed-Loop Proxy Measurements and Supplemental Characterization

Martin Seifrid
Materials Science and
Engineering, North Carolina
State University

Cory Simon
Chemical Engineering,
Oregon State University

Connor Bischak
Chemistry, University of Utah

Closed-Loop Hypothesis Generation for Automated Chemical Synthesis

Jolene Reid
Chemistry,
University of British Columbia

Yu Gan
Biomedical Engineering,
Stevens Institute of Technology

Structure Identification in Complex Chemical Mixtures Using Boltzmann Spectroscopy

Daniel Schwalbe-Koda
Materials Science and Engineering,
University of California,
Los Angeles

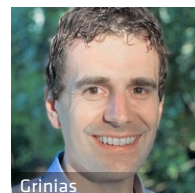
Gabe Gomes
Chemistry / Chemical Engineering,
Carnegie Mellon University

Jeffrey Lopez
Chemical and Biological
Engineering,
Northwestern University

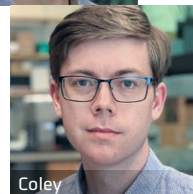
A Data-Driven Approach for Derisking Chemical Synthesis

Laura Ackerman-Biegasiewicz
Chemistry, Emory University

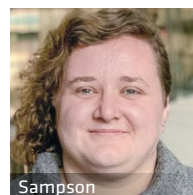
Gabe Gomes
Chemistry / Chemical Engineering,
Carnegie Mellon University



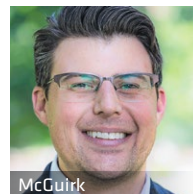
Grinias



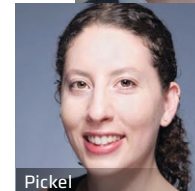
Coley



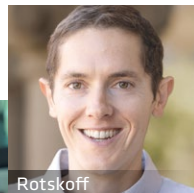
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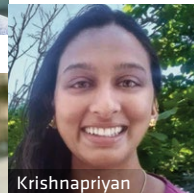
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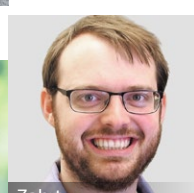
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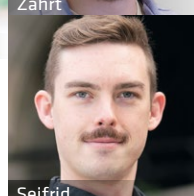
Rotskoff



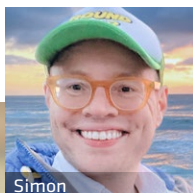
Krishnapriyan



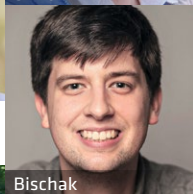
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Seifrid



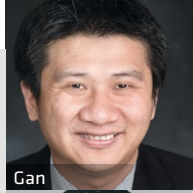
Simon



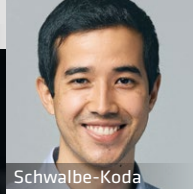
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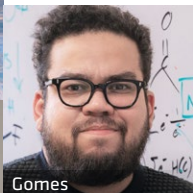
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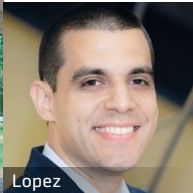
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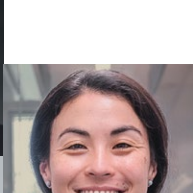
Schwalbe-Koda



Gomes



Lopez



Ackerman-Biegasiewicz

Funding provided by:

RCSA, the Arnold and Mabel Beckman Foundation, and the Frederick Gardner Cottrell Foundation.

Sustainable Minerals, Metals, and Materials

Year 1

Seaweed for Critical Element Extraction and Transformation (Sea-CrEET)

Nicholas Rolston

Electrical, Computer, and Energy Engineering, Arizona State University

Loretta Roberson

Bell Center, Marine Biological Laboratory

Julian West

Chemistry, Rice University

Engineering Plants and Algae as Dye-Free Alternatives to Fossil-Based Textiles

Helen Zha

Chemical and Biological Engineering, Rensselaer Polytechnic Institute

Loretta Roberson

Bell Center, Marine Biological Laboratory

Jaime Barros-Rios

Plant Science and Technology, University of Missouri

Synergistic Photomechanical Depolymerization

Junsoo Kim

Mechanical Engineering, Northwestern University

Grace Han

Chemistry, Brandeis University

Lucas Bao

Chemistry, Boston College

Electrocatalyst Formation from Extracted Critical Trace Elements in Copper Ores (EFFECT ECO)

Nicholas Rolston

Electrical, Computer, and Energy Engineering, Arizona State University

Agnes Thorarinsdottir

Chemistry, University of Rochester

Isabel Barton

Mining & Geological Engineering, University of Arizona

AI/ML-assisted Separation and Programmable Electrodeposition of Ni and Co

Jihye Kim

Metallurgical and Materials Engineering, Colorado School of Mines

Shuwen Yue

Chemical Engineering, Cornell University

Qi (Tony) Dong

Chemistry, Purdue University

Water-Free Silicate Activation for Valuable Metal Extraction

Erika La Plante

Materials Science and Engineering, University of California, Davis

Matthew Nava

Chemistry and Biochemistry, University of California, Los Angeles

Oscar Nordness

Earth and Environmental Engineering, Columbia University

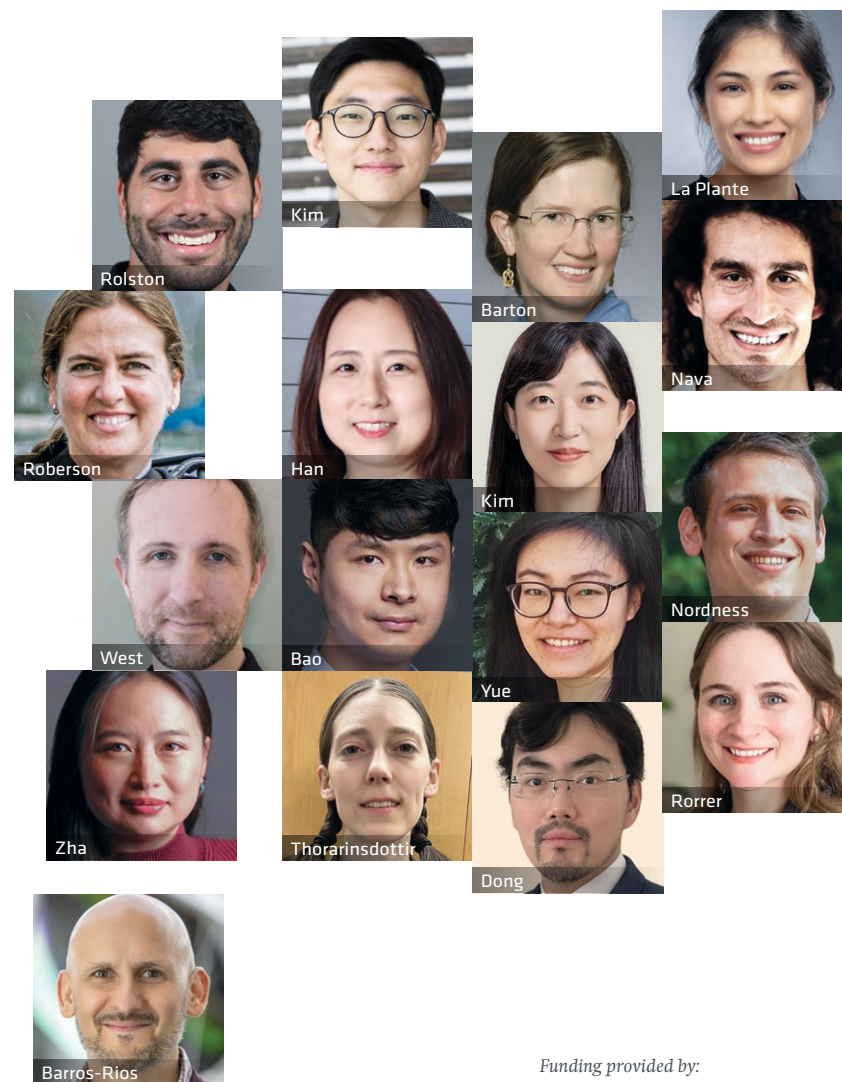
Co-Developing Advanced Catalysts and Engineered Microbes to Upcycle Mixed, Low-Value Plastic Waste into High-Value Recombinant Products

Helen Zha

Chemical and Biological Engineering, Rensselaer Polytechnic Institute

Julie Rorrer

Chemical Engineering, University of Washington



Funding provided by:
RCSA, The Alfred P. Sloan Foundation,
and The Kavli Foundation

Molecular Basis of Cognition

Year 3

A Presence of Departed Acts: Understanding Multisensory Interference and Working Memory Capacity with Focus on Olfactory Interactions

Ann-Sophie Barwich
History and Philosophy of Science and Medicine / Cognitive Science, Indiana University Bloomington

Wilma Bainbridge
Psychology, University of Chicago

The (Im)Mutability of Emotional-Motivational Modularity: Neurofeedback for the Reorganization of Valence

Kurt Fraser
Psychology, University of California, Berkeley

Nicole Ferrara
Physiology and Biophysics, Rosalind Franklin University

Jonathan Fadok
Psychology, Tulane University

Rewiring Genome in 3D to Enhance Cognition after Sleep Deprivation across Species

Farzaneh Najafi
Biological Sciences, Georgia Institute of Technology

Longzhi Tan
Neurobiology, Stanford University

Masashi Tabuchi
Neurosciences, Case Western Reserve University School of Medicine

Understanding the Neural Basis of Natural Behavior with Individualized RNNs

Marcelo Mattar
Psychology, New York University

Matthew Lovett-Barron
Neurobiology, University of California, San Diego

Antonio Fernandez-Ruiz
Neurobiology & Behavior, Cornell University

From Spikes to Neuromodulation: Uncertainty Coding in Rodents and Primates

Farzaneh Najafi
Biological Sciences, Georgia Institute of Technology

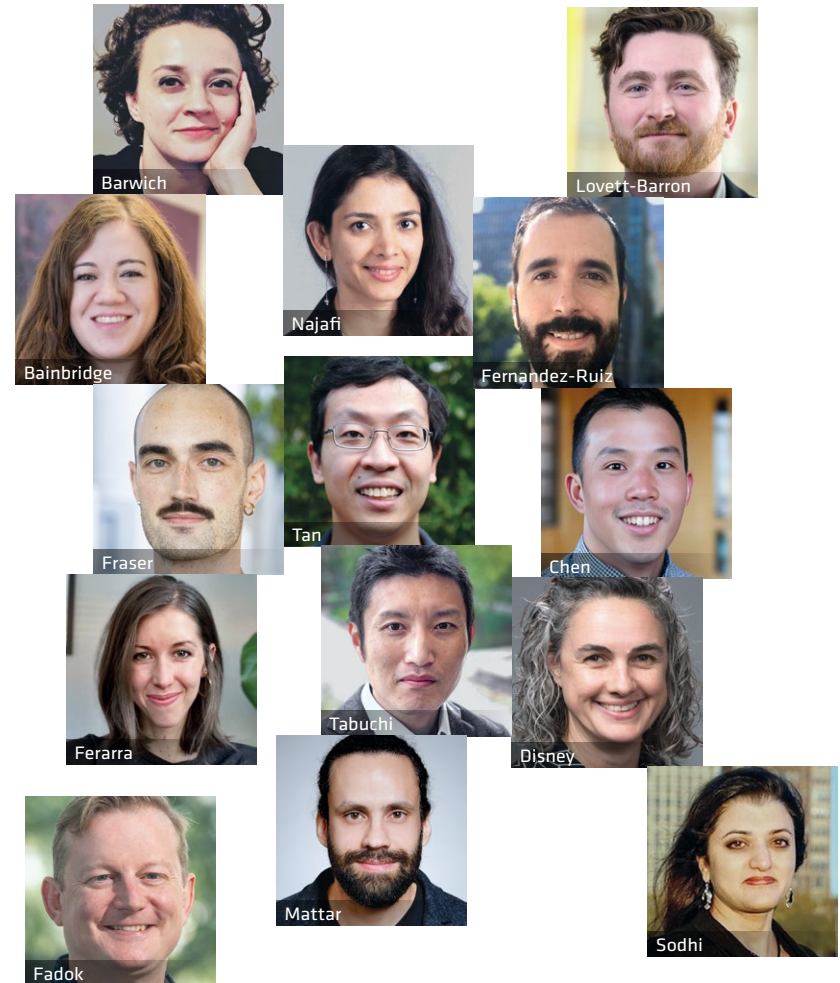
Ritchie Chen
Neurological Surgery, University of California, San Francisco

Anita Disney
Neurobiology, Duke University

Unraveling Epigenomic & Epitranscriptomic Mechanisms of Prenatal Stress: Sex Differences in Social Deficits across Generations

Monsheel Sodhi
Molecular Pharmacology and Neuroscience, Loyola University

Longzhi Tan
Neurobiology, Stanford University



Funding provided by:
RCSA, the Frederick Gardner Cottrell Foundation, the Canadian Institute for Advanced Research (CIFAR), The Kavli Foundation, the Walder Foundation, and the Azrieli Foundation.

Early Science with the LSST

Year 1

IMBH in the LMC? A Hypervelocity Star Survey with LSST

Wenbin Lu
Astronomy, University of California, Berkeley

Ana Bonaca
Carnegie Observatories, Carnegie Institution for Science

Kareem El-Badry
Astronomy, California Institute of Technology

Not So Heavy Metal: An Enhanced Rate of SLSNe at Cosmic Noon

Allison Strom
Physics and Astronomy, Northwestern University

Ben Margalit
Physics and Astronomy, University of Minnesota Twin Cities

Adam Miller
Physics and Astronomy, Northwestern University

White Dwarf Companions as Brown Dwarf Chronometers

Kareem El-Badry
Astronomy, California Institute of Technology

Caroline Morley
Astronomy, University of Texas at Austin

Rubin LSST as a Multi-Wavelength Discovery Engine for Relativistic Transients

Igor Andreoni
Physics and Astronomy, University of North Carolina at Chapel Hill

Tanmoy Laskar
Physics & Astronomy, University of Utah

Mathew Madhavacheril
Physics and Astronomy, University of Pennsylvania

A Unified Model of Stellar Systems in LSST-Y1 for Dark Matter Inference

Alexander Ji
Astronomy & Astrophysics, University of Chicago

Vera Gluscevic
Physics and Astronomy, University of Southern California

Multimessenger Transients in AGN Disks

Anna Ho
Astronomy, Cornell University

Maya Fishbach
Canadian Institute for Theoretical Astrophysics, University of Toronto

Elisabeth Newton
Physics and Astronomy, Dartmouth College

Dwarf Debris and Dark Matter: Searching for Evidence of Hierarchical Formation in the Stellar Halos of Dwarf Galaxies

Charlotte Christensen
Physics, Grinnell College

Nora Shipp
Astronomy, University of Washington

Burçin Mutlu-Pakdil
Physics and Astronomy, Dartmouth College

Towards a Census of Dual AGN Across Cosmic Time

Krista Smith
Physics and Astronomy, Texas A&M University

Adi Foord
Physics, University of Maryland, Baltimore County



Funding provided by:
RCSA, the Heising-Simons Foundation,
The Brinson Foundation, the Leinweber
Foundation, and independent
philanthropist Kevin Wells.

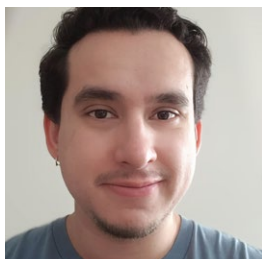
RCSA Fellows Initiative

The **RCSA Fellows Initiative** aims to advance the scientific enterprise in the United States and Canada by building and strengthening an engaged community of faculty who bring a variety of perspectives, experiences, and backgrounds to teaching and research in the physical sciences. The initiative makes no financial awards but supports the career advancement of each cohort through job-search preparation and community building. This includes pairing participants with host institutions for mock interviews with structured feedback, and through participation in annual conferences that help build a supportive, cross-disciplinary professional network. Fellows can rely on throughout and beyond the multi-year cycle of the program. In the initiative's first year, RCSA named eight postdoctoral scholars as RCSA Fellows.

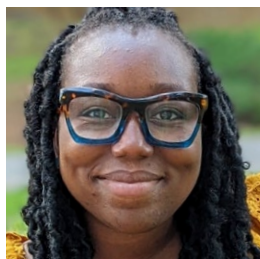
“RCSA and my host went out of their way to get me ready. I left (the mock interview) feeling motivated, challenged, and ready for the faculty job search process.”

RCSA Fellow Will Ndugire

2024 RCSA Fellows



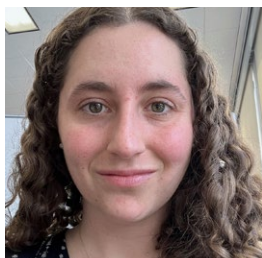
Carlos Blanco
Physics,
Princeton University



Catherine Denning-Jannace,
Chemistry,
Duke University



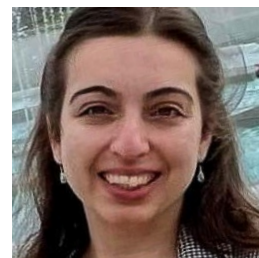
William Ndugire
Chemistry,
University of Massachusetts
Amherst



Sarah Blunt
Astronomy,
Northwestern University



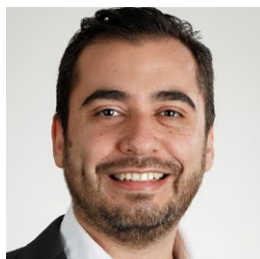
Philipp Gemmel
Chemistry,
University of Michigan



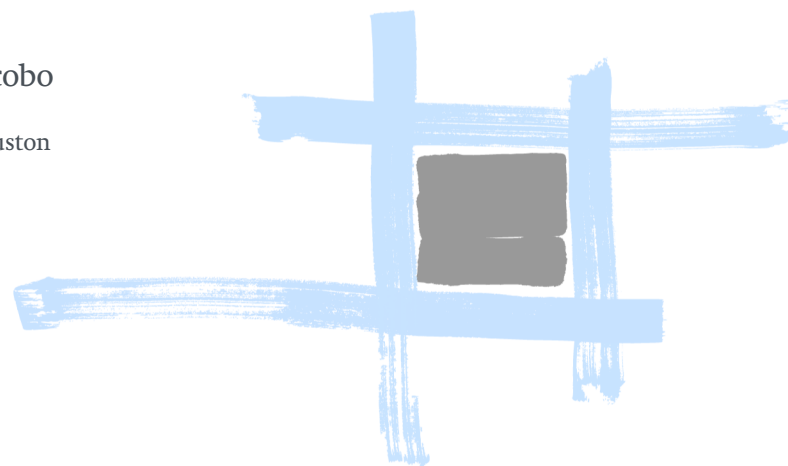
Eugenia Vasileiadou
Chemistry,
University of California,
Los Angeles



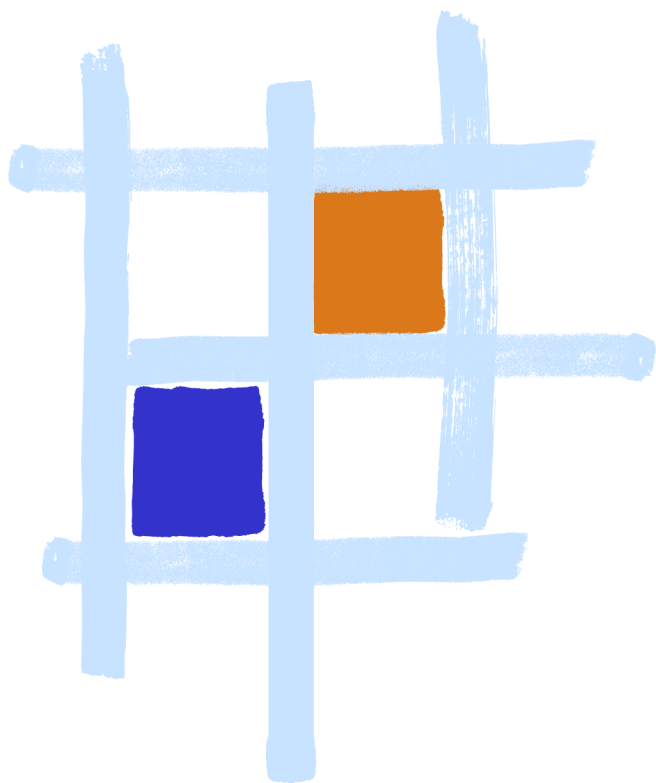
Michelle Brann
Chemistry,
Harvard University



Said Jalife Jacobo
Chemistry,
University of Houston



2024 Year in Review



January

Scialog: Advanced Energy Storage Fellows **Neil Dasgupta**, **Matthew McDowell**, and **Partha Mukherjee** built on the success of their Alfred P. Sloan Foundation-funded 2019 project to advance the next generation of solid-state batteries, expanding their collaboration to win two multimillion-dollar awards.

February

A Cottrell Scholar Collaborative project to create a community of practice to rethink the way physical chemistry is taught in undergraduate chemistry programs across the country published a paper on their efforts in *The Journal of Physical Chemistry*. LABSIP (Lowering Access Barriers to Success in Physical Chemistry) is a collaborative project led by eleven physical chemistry instructors and funded initially by RCSA.



Kristen McQuinn

astrophysical and planetary science topics.

Cottrell Scholar 2023 **Kristen McQuinn**, Rutgers, was named mission head of the Science Operations Center for NASA's Nancy Grace Roman Space Telescope. The telescope will be used to study dark energy and exoplanets, as well as other



A distinguished panel spoke at the Atlanta meeting of RCSA's Board of Directors, helping them learn more about science research and teaching at historically Black colleges and universities. From left: Daniel Linzer, RCSA President; Leyte Winfield, Spelman College; Wallace Sharif, Morehouse College; Talitha Washington, Clark Atlanta University; and Eugene Flood Jr., RCSA Board Chair.

Ten members of RCSA's community of scientists were awarded 2024 Sloan Research Fellowships: Scialog MBC Fellow **Wilma A. Bainbridge**, University of Chicago; CMC Fellow and Cottrell Scholar 2022 **Stephen D. Fried**, Johns Hopkins University; NES Fellow **Kandis Leslie Abdul-Aziz**, University of California, Riverside; MND Fellow **Stavroula K. Hatzios**, Yale University; NES Fellow **Jarad A. Mason**, Harvard University; ABI Fellow **Abdoulaye Ndao**, University of California, San Diego; CS 2022 **Zachariah A. Page**, University of Texas at Austin; SLU Fellow **Andrew Vanderburg**, Massachusetts Institute of Technology; CS 2021 **Alexandra Velian**, University of Washington; and CMC and MND Fellow **Wenjing Wang**, University of Michigan.



Luis A. Colón

2023 Holland Award recipient **Luis A. Colón**, SUNY Buffalo, was recognized with the American Association for the Advancement of Science's 2024 Lifetime Mentor Award for his longstanding commitment to advancing diversity in the chemical sciences.

Colón serves on the Advisory Committee for the RCSA Fellows Initiative.

Cottrell Scholars 2004 **Paul Chirik**, Princeton, and 2023 **Julian West**, Rice University, were featured in the cover story of the February 12-19 issue of *Chemical & Engineering News*. The article explored the quest to make catalysis greener and more cost effective.

March

As a team outing, the entire RCSA staff joined other volunteers at the Community Food Bank of Southern Arizona to pack food boxes for seniors in need.



RCSA Team at the Community Food Bank

April

The inaugural meeting of Scialog: Automating Chemical Laboratories convened in Tucson. The three-year initiative aims to catalyze collaborative projects marrying advances in automation and AI to key questions in fundamental research. Keynote speakers were Cottrell Scholar 2012 and FRED Award winner **Sarah E. Reisman**, California Institute of Technology, and **Klavs Jensen**, Massachusetts Institute of Technology.

Four Cottrell Scholars and Scialog Fellows were among 18 scientists selected as 2024 Camille Dreyfus Teacher-Scholars: Scialog NES Fellow **Chibueze Amanchukwu**, University of Chicago; CS 2022 and

ABI Fellow **Scott Cushing**, California Institute of Technology; AES and NES Fellow **Kelsey Hatzell**, Princeton University; and CS 2022 **Lisa Olshansky**, University of Illinois at Urbana-Champaign.

Cottrell Scholar 2023, Scialog CMC Fellow, and COVID-19 Initiative Awardee **Ronit Freeman**, University of North Carolina at Chapel Hill, published a paper in *Nature Chemistry* detailing programmable, self-assembling peptide–DNA architectures that mimic a cell's natural cytoskeleton and are able to modulate the shape of droplets and tune the release of payloads by controlling passive diffusion. This strategy moves the field toward the construction of functional, fully artificial cells.



Yinan Wang, Mike McGuirk, and Amir Sheikhi attended the inaugural meeting of Scialog: Automating Chemical Laboratories.

Four members of RCSA's community of scientists were elected 2023 AAAS Fellows in chemistry: Scialog SEC Fellow **David Cliffler**, Vanderbilt University; Cottrell Scholar 2015 **Jennifer Heemstra**, Washington University in St. Louis; CS 2005 **Adam Urbach**, Trinity University; and NES Fellow **Jenny Yang**, University of California, Irvine.

May

Cottrell Scholars, Scialog participants and initiative advisors welcomed the first cohort of RCSA Fellows to an extended community of support, mentorship, and skill building at the first annual RCSA Fellows Conference May 21–22 in Tucson.



Luisa Whittaker-Brooks and Catherine Denning-Jannace worked together during the RCSA Fellows Conference.

Cottrell Scholar 2009, 2017 SEED Award winner and Scialog TDA Fellow **Duncan Lorimer**, astronomy, West Virginia University, was elected to the Fellowship of the Royal Society, the UK's national academy of sciences.

Three Cottrell Scholars were elected to the National Academy of Sciences in recognition of their achievements in original research: Cottrell Scholar 1997 **Clare Grey**, University of Cambridge; CS 2000 **David DeMille**, University of Chicago; and CS 2009 **Maura McLaughlin**, West Virginia University.

Cottrell Scholar 2020 **Elisabetta Matsumoto**, Georgia Institute of Technology, published a paper in *Nature Communications* about her team's work decoding the underlying principles that determine the elastic behavior of knitted fabrics.

Cottrell Scholar 2024 **Carlos Argüelles-Delgado**, Harvard University, was among 10 emerging research leaders to be named 2024-2026 CIFAR Azrieli Global Scholars.

Chemical & Engineering News named three members of the RCSA community to their "2024 Talented 12" list for using chemistry to change the world for the better: Cottrell Scholar 2023 **Julian West**, Rice University, and Scialog NES Fellows **Ahmed Badran**, Scripps Research Institute, and **Chibueze Amanchukwu**, University of Chicago.

Cottrell Scholar 2022 and Scialog AES Fellow **Lauren Marbella**, Columbia University, published a paper in the journal *Joule* detailing how nuclear magnetic resonance spectroscopy techniques can be leveraged to design the anode surface in lithium metal batteries.

Scialog Fellow **Aaron Engelhart**, University of Minnesota, published research stemming from his Signatures of Life in the Universe awards in the journal *Nature Communications*. It examines the salt tolerance of RNA and how Mars' unique geochemical environment could influence the formation of life.

Cottrell Scholar 2021 and Scialog CMC Fellow **Alexis Komor**, University of California, San Diego, published a paper in *Nature Biotechnology* on the development of multiplexed orthogonal base editor (MOBE) systems, which could be used to efficiently edit relevant cell lines of polygenic diseases.

The Humboldt Foundation awarded Cottrell Scholar 2017 and Scialog AES Fellow **Natalia Shustova**, University of South Carolina, its Friedrich Wilhelm Bessel Research Award for excellence in research and innovation. Shustova, whose research on light harvesting could help advance clean energy and the development of sensors to detect nuclear radiation, serves on the Cottrell Scholar Selection Committee.

June

Cottrell Scholars 2009 **Penny Beuning** and 2005 **Adam Urbach** co-edited a new ACS Publications *Symposium Series* book stemming from a Cottrell Scholars Collaborative effort to improve career and professional mentoring of students in the physical sciences. *Professional Mentoring Programs for Science Students: Career Mentoring for Students in the Physical Sciences* is a resource for institutions and faculty

looking to create programs to help their students, who may lack access to high-quality career and professional mentoring.

Cottrell Scholar 2013 and Scialog SEC Fellow **Gordana Dukovic**, University of Colorado Boulder, was among eight mid-career faculty working on fundamental challenges in the physical sciences to be named a Brown Investigator. The 2024 cohort was the first selected through the newly formed Brown Institute for Basic Sciences at Caltech.

Scialog CMC Fellow **Caitlin Davis**, Yale University, received a 2024 Beckman Young Investigator Award. These awards are given to foster the invention of methods, instruments, and materials that will open new avenues of research in science.



Naomi Lee

Assistant Professor in the Department of Chemistry and Biochemistry at Northern Arizona University, was named 2024 recipient of the **Council on Undergraduate Research's** Silvia Ronco Innovative Mentor Award. The award was established in 2022 by a gift from RCSA.

Naomi Lee, Assistant Professor in the Department of Chemistry and Biochemistry at Northern Arizona University, was named 2024 recipient of the **Council on Undergraduate Research's** Silvia Ronco Innovative

July

RCSA's Cottrell Scholar community gathered July 17–19 in Tucson to welcome new members and celebrate the 30th year of a program that has grown in diversity and impact since its inception in 1994. The theme of the conference was “Inclusive Science Communication: Making Science ‘Make Sense’ for Everybody.”



Cottrell Scholars Jennifer Ross and Gina MacDonald work on a collaborative project proposal at the Cottrell Scholar Conference.

Scialog MZT Fellows **Giselle Medina**, USDA-Agricultural Research Service, and **Angad Mehta**, University of Illinois Urbana-Champaign, have a paper in *Nature* on a method to comprehensively map the B cell repertoire and get paired antibody sequences from pigs through single-cell sequencing experiments. Increased understanding of pig immune responses could pave the way to better vaccines and zoonosis prediction.

Cottrell Scholar 2008 **Fadi Bou-Abdallah** and postbac **Maximilian Beyer**, SUNY Potsdam, whose work was supported by a 2023 Cottrell Postbac Award,

published a paper featured on the cover of *Analytical Methods*, a Royal Society of Chemistry journal. They reported a simple and highly sensitive colorimetric method for the detection and quantification of proteins.


August

Roman Kogler and **Eva von Domaros** were recipients of the 2024 Fulbright-Cottrell Award for excellence in research and teaching. Kogler is an experimental particle physicist at the Deutsches-Elektronen-Synchrotron, DESY, in Hamburg. Von Domaros leads a research group and is a professor of computational materials science at the Otto Schott Institute of Materials Research at Friedrich Schiller University in Jena. Fulbright-Cottrell Scholars take part in RCSA's Cottrell Scholar Conferences and participate in Cottrell Scholars Collaborative projects.



Roman Kogler

Eva von Domaros



Cottrell Scholar 2021 and Scialog ABI Fellow **Rosario Porras-Aguilar**, University of North Carolina at Charlotte, published a paper in *Nature Communications Physics* demonstrating an economical quantitative phase microscopy system for long-term, noninvasive biological monitoring and research applications.

Cottrell Scholar 2015 **Jen Heemstra**, Washington University in St. Louis, delivered one of the Plenary Session keynote talks at the American Chemical Society National Meeting in Denver. Her topic: “Cultivating the Culture to Elevate Scientific Discovery.”

Cottrell Scholar 2024 and Scialog SLU Fellow **Katherine de Kleer**, California Institute of Technology, won the 2024 Harold C. Urey Prize given by the Division for Planetary Sciences of the American Astronomical Society. The prize recognizes outstanding achievements in planetary science by an early career scientist. (1934 Nobel Laureate Urey received a RCSA grant in 1938 for research on isotopes.)

Cottrell Scholar 1994 and 2023 IMPACT Awardee **Mark E. Bussell**, Western Washington University, won the American Chemical Society’s Award for Research at an Undergraduate Institution, sponsored by RCSA. Also selected to receive 2025 national awards from the ACS were: CS 2012 and 2020 SEED Awardee **Seth B. Herzon**, Yale University, ACS Award for Creative Work in Synthetic Organic Chemistry; CS 2000 and

Scialog MZT Facilitator **Wilfred A. van der Donk**, University of Illinois Urbana-Champaign, Alfred Bader Award in Bioinorganic or Bioorganic Chemistry; CS 2020 **Keary M. Engle**, Scripps Research, and CS 2001 **Andrei K. Yudin**, University of Toronto, Arthur C. Cope Scholar Awards; Scialog SEC Fellow **Raymond E. Schaak**, Pennsylvania State University, F. Albert Cotton Award in Synthetic Inorganic Chemistry; CS 1996 **Gregory C. Fu**, California Institute of Technology, Gabor A. Somorjai Award for Creative Research in Catalysis; and CS 2003 **Brian M. Stoltz**, California Institute of Technology, Herbert C. Brown Award for Creative Research in Synthetic Methods.

September

The first meeting of Scialog: Sustainable Minerals, Metals, and Materials was held in Tucson. The three-year initiative aims to spark advances in the mining, design, manufacture, and disposal of materials needed to achieve a more sustainable and low-carbon energy system. **Ikenna C. Nlebedim**, Ames National Laboratory, emphasized a holistic and practical approach to the transition to a cleaner future with his keynote talk, while **Jonathan Wilker**, Purdue University, used his experiences working to bring bio-based adhesives to market to illustrate roadmaps for displacement of existing non-sustainable materials. The theme of this Scialog aligns with the work of RCSA’s founder, Frederick Gardner Cottrell, who made significant contributions to sustainable mining

practices in the early 1900s with his invention of the electrostatic precipitator, the first industrial-scale anti-pollution device.

Cottrell Scholar 2024 **Maren Mossman**, University of San Diego, was awarded a prestigious National Science Foundation grant that will enable her lab to expand its exploration of the potential and limitations of future quantum-sensing technologies.

Cottrell Scholar 2019 **Victor Acosta**, University of New Mexico, and CS 2017 **Monika Schleier-Smith**, Stanford University, were named 2024 Experimental Physics Investigators by the Gordon and Betty Moore Foundation.

Three members of the RCSA community pursuing boundary-pushing work have been named Schmidt Science Polymaths: Scialog MND Fellow **Lawrence David**, Duke University, Cottrell Scholar 2022 **Orit Peleg**, University of Colorado Boulder, and AES Fellow **Neil Dasgupta**, University of Michigan.

The Biophysical Society published a new book by 2010 Cottrell Scholar, 2022 STAR Awardee and Scialog MCL Fellow **Rae Robertson-Anderson**, University of San Diego, titled *Biopolymer Networks: Design, Dynamics and Discovery*. The text is a broad overview of biopolymer networks written for an interdisciplinary audience of cellular and molecular biologists, soft matter and polymer physicists, materials scientists, and chemical engineers.

October

The third and final meeting of Scialog: Molecular Basis of Cognition, which aims to advance understanding of the molecular or mechanistic processes that underlie memory and cognition, was held October 12–15 in Tucson. Keynote speaker **Jacob Hooker**, Massachusetts General Hospital, offered his thoughts on advancements in neuroimaging that can help science achieve breakthroughs in the coming decade.

Cottrell Scholar 2006 **Keivan Stassun** was named a 2024 MacArthur Fellow in recognition of his work to expand opportunities in STEM for underrepresented populations. Stassun helped found the Fisk-Vanderbilt Master's-to-PhD Bridge Program as part of his original CS Award, and the Frist Center for Autism and Innovation with support from a 2017 SEED award. He also serves on our RCSA Fellows Advisory Committee.

The American Physical Society elected its Fellows for 2024, including: Cottrell Scholars 2004 **Anthony Dinsmore**, University of Massachusetts Amherst; 2015 **Kai-Mei Fu**, University of Washington; 2007 Nancy Forde, Simon Fraser University; 2007 **Neepa Maitra**, Rutgers University; and Scialog MCL Fellow **Aparna Baskaran**, Brandeis University. Also elected were Cottrell College Science Awardees 2007 **Daniel Clark**, California State University, Chico, and 1989, 2000 and 2005 **Enrique Jose Galvez**, Colgate University.



Participants of the third and final meeting of Scialog: Molecular Basis of Cognition

Julien Berro, Yale University, and **Alexander A. Green**, Boston University, shared a 2024 National Institutes of Health Director's Transformative Research Award based on preliminary findings stemming from their 2021 Scialog: Chemical Machinery of the Cell award. Their project aims to advance basic research in mechanobiology and pave the way for the first therapeutic strategies informed by the mechanical signals and target mechano-properties of diseased cells and proteins.

Three Scialog Fellows won NIH Director's New Innovator Awards for 2024: AUT Fellow **Stacy Copp**, University of California, Irvine; MND Fellow **Santiago Cuesta**, Rutgers; and NES Fellow **Yuzhang Li**, University of California, Los Angeles.

“Mighty Microbes,” a film from RCSA-supported Chemistry Shorts, highlights the work of Scialog NES Fellow **Ariel Furst**, Massachusetts Institute of Technology. The film explores how new, self-assembling polymer coatings create chemical “suits of armor” for microbes, giving problem-solving scientists the ability to transport them to wherever they need to go.

Participants in the Cottrell Scholars Collaborative project Enhancing Science Courses by Integrating Python (ESCIP) published a paper in *Nature Computational Science* highlighting their activities and plans. Coauthors include Cottrell Scholar 2019 **Christina Vizcarra**, CS 2022 **Ryan Trainor**, **Ashley Ringer McDonald**, **Chris T. Richardson**, CS 2021 **Davit Potoyan**, **Jessica A. Nash**, CS 2020 **Britt Lundgren**, CS 2017 **Tyler Luchko**, **Glen M. Hocky**, CS 2019 **Jay Foley**, CS 2015 **Tim Atherton**, and CS 2018 **Grace Stokes**.

Four Cottrell Scholars were among nine new Henry Dreyfus Teacher-Scholars for 2024: CS 2017 and Scialog AES Fellow **Robert Berger**, Western Washington University; CS 2021 **Daniela Fera**, Swarthmore College; CS 2019 **Kana Takematsu**, Bowdoin College; and CS 2019 **Christina Vizcarra**, Barnard College. The award honors young faculty in the chemical sciences who have created an outstanding independent body of scholarship and are deeply committed to education with undergraduates.

Cottrell Scholar 1999 **Rigoberto Hernandez**, Johns Hopkins University, was elected 2026 president of the American Chemical Society. Hernandez is an active Cottrell Scholar and member of many Cottrell Scholars Collaborative projects, including the Academic Leadership Training (ALT) workshops. He is a 2016 TREE Award and 2020 IMPACT Award recipient, served as a Facilitator for Scialog MCL and CMC, and is a current member of the Cottrell Scholar Selection Committee.

November

The first meeting of Scialog: Early Science with the LSST convened in Tucson with the goal of advancing the foundational science needed to realize the full potential of the Rubin Observatory upcoming Legacy Survey of Space and Time. Jackie Faherty, the American Museum of Natural History, and David W. Hogg, New York University, gave keynote talks. The initiative represents a fulfilling new chapter in the story of RCSA's long-term support of the Rubin Observatory, located in north-central Chile. RCSA played a foundational role in its birth, helping establish the LSST Corporation (now the LSST Discovery Alliance) in 2003 and providing early financial and business support to launch the telescope's construction, including the design and construction of its primary mirror starting in 2007.



Keynote speakers Jackie Faherty and David W. Hogg at the first meeting of Scialog: Early Science with the LSST.

December

Cottrell Scholar 2014, Scialog CMC Fellow and ABI Facilitator **Jennifer Prescher** published a paper in *Nature Communications* on a bioluminescent platform for serial imaging of RNAs. This work could provide a foundation for visualizing RNA dynamics from the micro to the macro scale.

Cottrell Scholar 2003 and Scialog Solar Energy Conversion Fellow **Richard Taylor**, University of Oregon, authored an article in *Physics Today* on fractal bionics and interdisciplinary efforts needed to create better connections between artificial implants and the body's neurons.

Through staff donations and matching gifts by the foundation, RCSA contributed more than \$18,700 total in December to two organizations serving people in need in Tucson: the Community Food Bank of Southern Arizona and Aviva Children's Services.

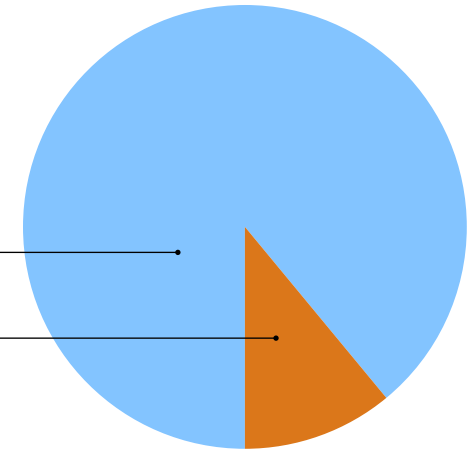
2024 Financial Summary

Where Our Money Goes

Program Expenses, including
Grants and Awards **88%**

General and Administrative Costs **12%**

Total Expenses \$13.4M



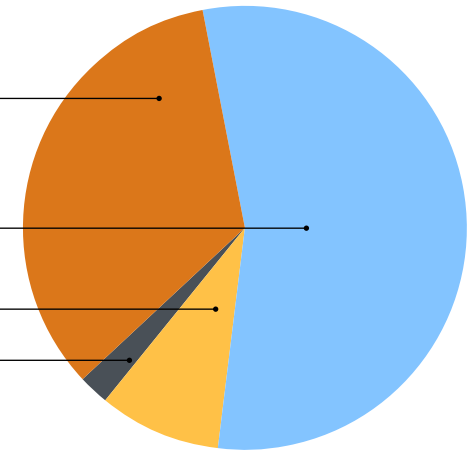
Cottrell Scholar Awards **28%**

Scialog Collaborative Awards
*(includes \$3.2M in partner-funded awards
administered by RCSA and excludes \$792K in
non-administered partner-funded awards)* **59%**

Cottrell Career Advancement,
Collaborative Awards, and Holland Awards **9%**

Discretionary Grants and Special Initiatives **4%**

Grants and Awards \$8.2M

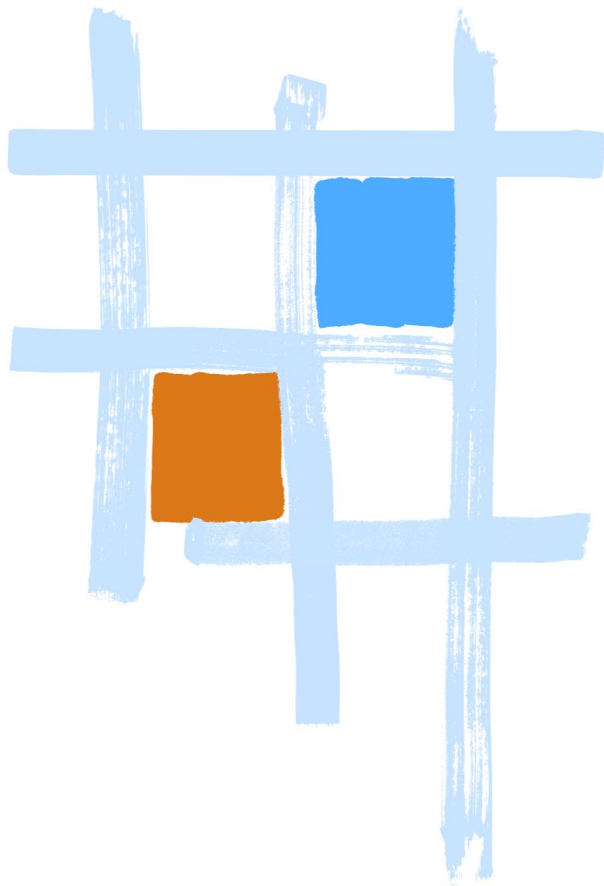


Net Assets at Beginning of Year **\$219.2M**

Net Assets at End of Year **\$237.1M**

The financial activities of Research Corporation for Science Advancement were audited by Keegan Linscott & Associates, PC. For the complete audited financial statements, please visit our website at rescorp.org.

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An engaged community of early career faculty

Innovative ideas for basic research

Integration of research and science teaching

Interdisciplinary research

Building the academic leadership of the future